REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1-53 and 56-76 are pending in the application, with Claims 1, 23, 45-50, 56, and 70-76 being independent.

Claims 54-55 have been cancelled without prejudice to or disclaimer of the subject matter contained therein. Claims 1, 23, 25, 45, 46, and 48 have been amended. Claims 56-76 are newly presented. No new matter is believed to have been added.

Claims 48-50 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,708,146 ("Sewall"). Claims 51-53 have been rejected under 35 U.S.C. § 103(a) as being obvious over Sewall. Claims 1-3, 6-7, 9-11, 14-17, 20-25, 28-29, 31-33, 36-39, 42-47, and 54-55 have been rejected under 35 U.S.C. § 103(a) as being obvious over Sewall in view of U.S. Patent No. 6,438,513 ("Pastor"). Claims 4 and 26 have been rejected under 35 U.S.C. § 103(a) as being obvious over Sewall in view of Pastor, and further in view of U.S. Patent No. 5,799,276 ("Komissarchik"). Claims 8 and 30 have been rejected under 35 U.S.C. § 103(a) as being obvious over Sewall in view of Pastor, and further in view of U.S. Patent No. 6,516,090 ("Lennon"). Claims 5 and 27 have been rejected under 35 U.S.C. § 103(a) as being obvious over Sewall in view of Pastor, further in view of Komissarchik, and further in view of U.S. Patent No. 5,742,694 ("Eatwell"). Claims 12-13, 15, 18, 34-35 and 40 have been rejected under 35 U.S.C. § 103(a) as being obvious over Sewall in view of Pastor, and further in view of U.S. Patent No. 6,377,919 ("Burnett"). Claims 19 and 41 have been

rejected under 35 U.S.C. § 103(a) as being obvious over Sewall in view of Pastor, further in view of Burnett, and further in view of U.S. Patent No. 5,884,255 ("Cox").

These rejections are respectfully traversed.

Sewall describes an acoustic classification system intended to identify different types of data transmitted over a digital transmission channel. Disclosed at column 6, lines 12 to 22 of Sewall are different classes of data signals that are carried over the channel and which the classification system is designed to detect. The system discriminates between the different data signals by looking for specific characteristics that the different types of data signals possess. To detect these characteristics, Sewall teaches processing the signals using second order moment analysis and autocorrelation analysis. The resulting "parameters" are therefore representative of these characteristics of the data, and are not representative of the signals themselves. (Indeed, this is evident since all speech will be classified into the same class – class 8.) The parameters generated according to Sewall, therefore, are not representative of speech signal values. Instead, they are representative of some characteristic common to all speech signals.

For example, the autocorrelation analysis of Sewall identifies signals having periodic components and their approximate frequencies. This is because a completely random signal will have a high autocorrelation value for a zero lag, and approximately zero values for all other lags. However, for a periodic signal, peaks in the autocorrelation function will appear at different lags depending on the periodicity (frequency) of the signal. Since data signals and speech signals have different periodic components, it is possible to distinguish

between speech and different data signals by looking at the value of the autocorrelation function at different lags.

In independent claim 48 of the present invention, a change has been made herein to clarify a feature of means that processes, for speech signal values in each group of speech signal values, a set of parameter values representative of the speech signal values in the group. As discussed above, Sewall describes processing speech signals to determine parameter values that are not representative of the speech signal values in themselves, but which are representative of a characteristic of speech. Thus, it is submitted that the invention is distinguishable over Sewall at least due to "parameter values representative of speech signal values," which is included in claim 48.

Moreover, Applicant submits that Sewall does not teach or suggest that processing means comprises means for varying the number of parameter values used to represent the speech signal values in each group, as recited in claim 48. Applicant submits that column 11, lines 11 to 17 of Sewall merely describes the provision of a channel model used to validate the performance of the acoustic classification system. In particular, in order to validate the system, Sewall describes providing raw data signals of different types and passing these through a channel model so that the data output by the model is more representative of the signals that would actually be experienced in a real system. The channel model allows the introduction of controlled attentuation distortion, frequency offset, envelope delay distortion, flat attenuation, echoes, additive noise, and so on, which can all occur in the real channel over which the data signals will pass. However, this is submitted to be quite different from the claimed processing means which processes speech signal values after they

have been divided into groups, to determine a set of parameter values representative of the speech signal values in each group.

With regard to independent claim 49, Applicant submits that is also distinguishes the invention over Sewall due to recitation of determining sets of parameter values representative of speech signal values. As discussed above, Sewall does not teach generation of parameter values representative of speech signal values, but teaches generation of parameter values representative of some characteristic common to all speech signals.

Further, claim 49 recites that processing means includes a memory for storing data defining a predetermined function which gives, for a set of speech signal values of a group, a probability density for parameters of a predetermined signal model which is assumed to have generated the speech signal values in the group, the probability density defining, for a given set of parameter values, the probability that the predetermined signal model has those parameter values, given that the model is assumed to have generated the speech signal values in the group. Applicant submits that it is not appropriate to compare this stored function to the signal probability density functions of Sewall, disclosed, for example, in Figure 5 and at column 13, lines 13 to 37 of Sewall.

Claim 49 recites means for applying a set of speech signal values of a current group to the stored function. After the signal values have been applied, the function gives the probability density for the parameters. In contrast, in Sewall, the data signal values are first processed to generate parameter values representative of the characteristics of the data signals (i.e., the autocorrelation parameters and the second order moments), and then those parameter

values are applied to the stored probability density functions (one such function for each class) which output, as a result, the probability that the data signals belong to the respective class.

The claimed applying means is said to read on an embodiment in Sewall described at column 15, lines 6 to 25 and shown in Figure 24. In that embodiment, normalized discriminant variables obtained from the autocorrelation sub-system and a central second order moment sub-system are used by a decision sub-system 38 to determine the value (V_c) of a discriminant function for each class c. These values are then applied to the probability density functions stored in a database 40. Applicant submits that it is therefore clear that Sewall does not apply a set of speech signal values of a current group to a stored function, as recited in claim 49, and that the stored function of claim 49 is totally different from the functions stored in the database 40 according to Sewall.

Further, Applicant submits that since Sewall discloses different stored functions, it cannot disclose the claimed means for processing a function to derive samples of parameter values from a probability density for a current group, nor can it disclose the claimed evaluating means. In particular, in Sewall, once the value (V_c) of the discriminant function has been applied to the respective probability density function, the result is a single probability value. Therefore, it is not possible according to Sewall to process a function to derive samples of parameter values as recited in claim 49, nor is it possible to evaluate the probability density for different numbers of parameters as also recited in claim 49.

Accordingly, Applicant submits that independent claim 49 patentably distinguishes the invention over Sewall.

With regard to independent claim 50, Applicant submits that Sewall does not teach or suggest the particular function that is claimed, nor means for applying a set of received audio signal values to the stored function, means for processing the function, with the set of received audio signal values applied, to derive samples of parameter values from a probability density, or means for analysing at least some of the derived samples of parameter values. Applicant submits that, for reasons similar to those discussed with respect to claim 49, claim 50 is also patentable over Sewall.

The rejection of claims 1-3, 6-7, 9-11, 14-17, 20-25, 28-29, 31-33, 36-39, 42-47, and 54-55 as being obvious over Sewall in view of Pastor is traversed for the following reasons.

Sewall does not teach or suggest storing data defining a predetermined function, as discussed above in response to the rejection over Sewall alone. Further, as discussed above, the probability density functions that are stored according to Sewall are not in terms of a set of speech signal values. Instead, the stored probability density functions are a function of autocorrelation coefficients and other parameters input to the decision unit 38. Further, as discussed above, Sewall does not disclose or suggest applying a set of received speech signal values to the stored function, which is recited in independent claims 1, 23, and 45 to 47.

Applicant submits that even if Pastor were to be combined with Sewall, one of ordinary skill in the art would still not arrive at the claimed invention because Pastor does not teach or suggest at least the stored function and the processing means or step of independent claims 1, 23, and 45 to 47.

Further, Applicant submits that one of ordinary skill in the art would not have considered combining Pastor with Sewall. In particular, Pastor relates to a system for processing noisy speech signals in order to attenuate the noise within the signal, a system very different from the system described in Sewall. Further, it is not clear how the system of Pastor could be incorporated into the system of Sewall. In particular, the processing techniques described in Pastor are specific to speech signals. In contrast, Sewall processes not only speech signals, but a wide variety of data signals. Indeed, it seems likely that the adaptive noise cancelling techniques described in Pastor would actually attenuate non-speech data signals if the techniques were to be used in the Sewall system. Further, it is not clear how the active noise suppression techniques described in Pastor could be used in order to modify the stored probability density functions described in Sewall. Further still, Sewall teaches performing an autocorrelation of input signals for different autocorrelation lags. As is well known in the art, when the autocorrelation of a noise signal is taken, the result is very low autocorrelation values for non zero lags, since noise is usually aperiodic in nature. Therefore, the processing by Sewall would remove the noise, and there would seem to be little need for any further noise suppression.

Applicant accordingly submits that independent claims 1, 23, and 45 to 47 patentably distinguish the invention over Sewall and Pastor, whether the art is taken alone or in combination.

Applicant submits that none of the other cited art, taken alone or in combination, compensates for the deficiencies of Sewall and Pastor with respect to the claimed invention.

Reconsideration and withdrawal of the §§ 102 and 103 rejections are respectfully requested.

The rejected dependent claims are submitted to be allowable due to dependency from allowable base claims, and further due to additional recited features.

New independent claim 56 is based on existing claim 1, but written without using "means plus function" language, and is submitted to be allowable for reasons similar to those given above for claim 1. Dependent claims 57 to 69 depend directly or indirectly from Claim 56 and are submitted to be allowable at least for this reason.

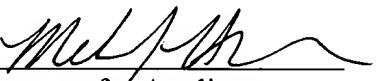
New independent claim 70 is directed to a computer readable medium storing computer implementable instructions for causing a programmable computer device to carry out a speech processing method corresponding to claim 23. This claim is submitted to be allowable for reasons similar to those given above for claim 23.

New independent claims 71 to 76 correspond to existing claims 45 to 50, but written without "means plus function" language. These claims are submitted to be allowable for reasons similar to those given above for claims 45 to 50.

Applicant submits that the application is in condition for allowance. Favorable consideration and passage to issue at the Examiner's early convenience are respectfully requested.

Applicant's undersigned attorney may be reached in Washington, D.C. by telephone at (202) 530-1010. All correspondence should continue to be directed to the below-listed address.

Respectfully submitted,



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